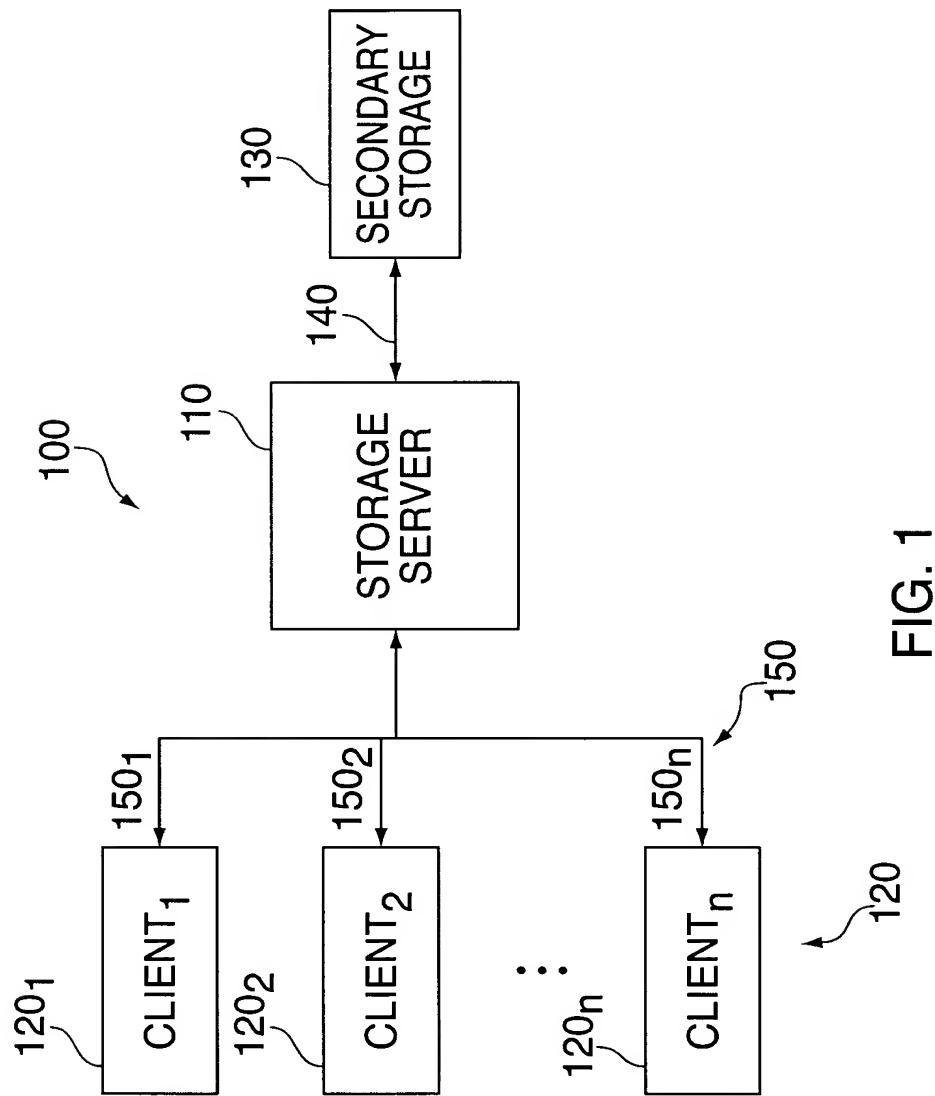A METHOD OF DATA MANAGEMENT FOE EFFICIENTLY STORING AND
RETRIEVING DATA TO RESPOND TO USER ACCESS REQUESTS
Clement G. Taylor et al., inventors
Attorney Docket No.: DIVA/146CIP1C1
Eamon J. Wall, Attorney
Telephone: 732-530-9404

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FIG. 1

A METHOD OF DATA MANAGEMENT FOR EFFICIENTLY STORING AND
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FIG. 2

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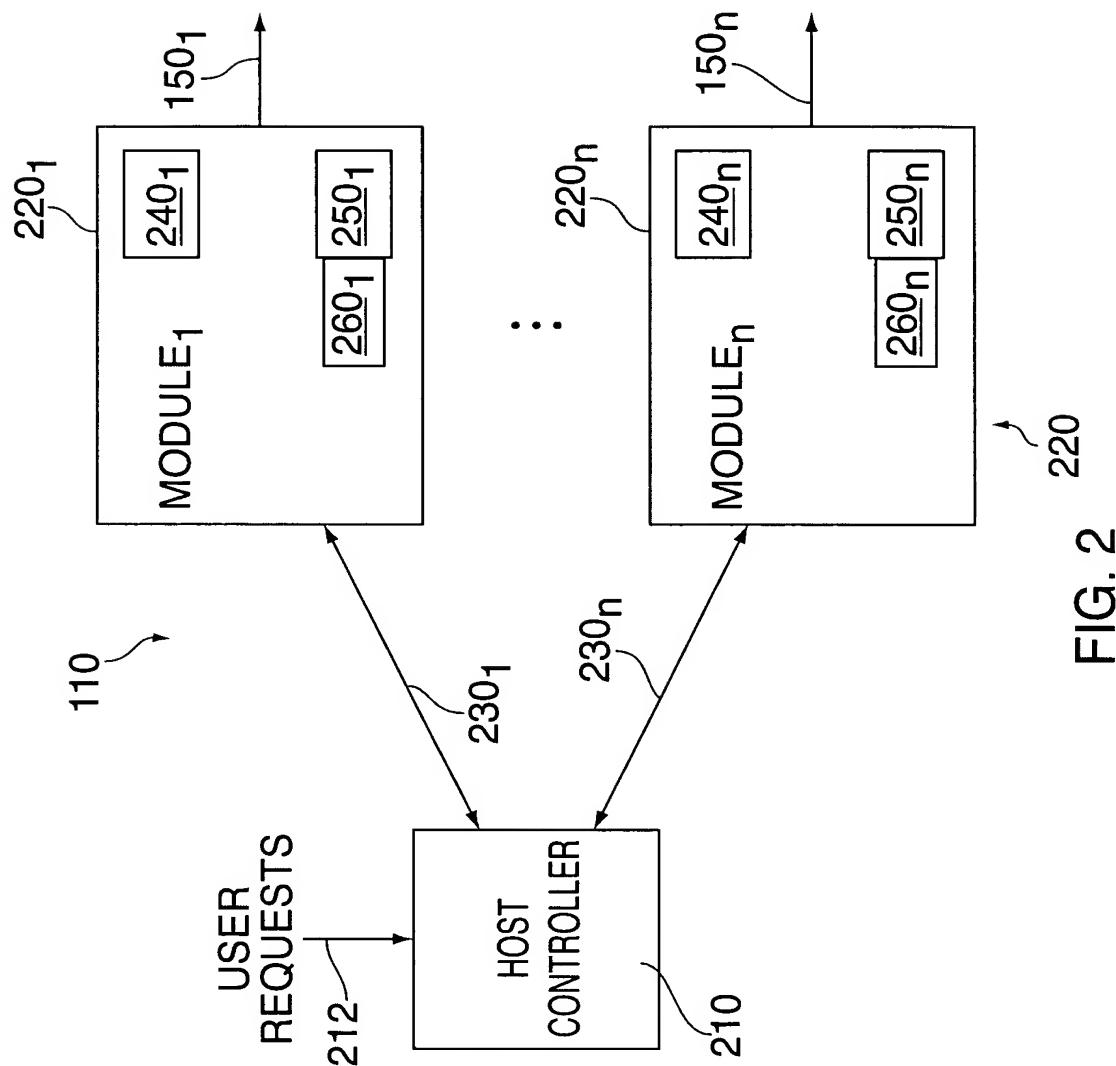Telephone: 732-530-9404

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START —310

300

320

SELECT DATA ITEM
d IN SECONDARY
STORAGE THAT IS
NOT STORED ON
DISK SUCH THAT
(1) d FITS IN THE
AVAILABLE DISK SPACE
OF SOME MODULE,
AND (2) d IS AS
POPULAR AS
POSSIBLE

330

370

END ← NO — DOES
SUCH A
d EXIST
?

360

STORE d
in m

YES

LET M=MODULES
WITH SUFFICIENT
SPACE TO STORE d

LET m∈M BE THE
MODULE WITH THE
LOWEST LOAD

340

350

FIG. 3

A METHOD OF DATA MANAGEMENT FOE EFFICIENTLY STORING AND
RETRIEVING DATA TO RESPOND TO USER ACCESS REQUESTS
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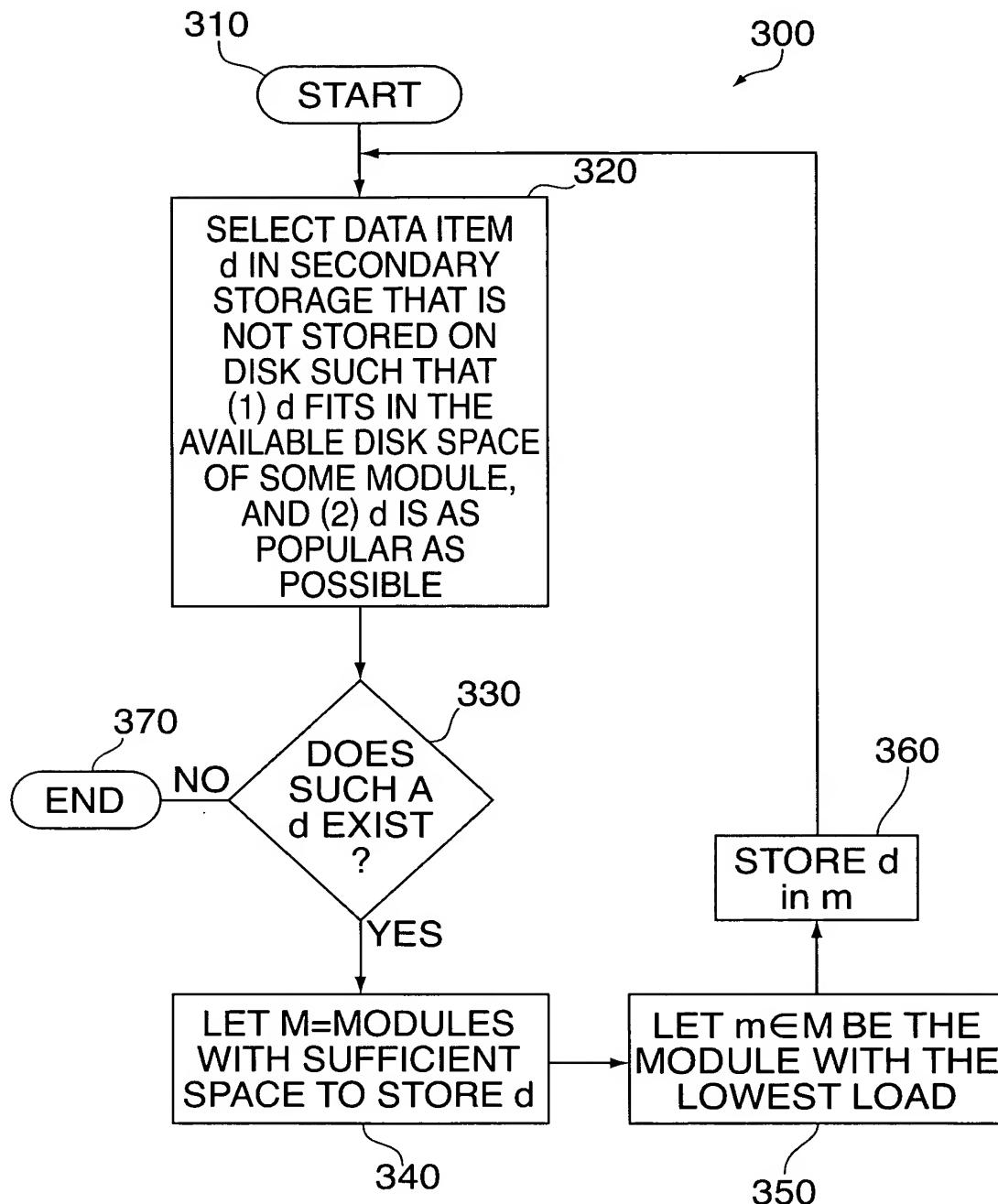Eamon J. Wall, Attorney
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FIG. 4

A METHOD OF DATA MANAGEMENT FOE EFFICIENTLY STORING AND
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FIG. 5

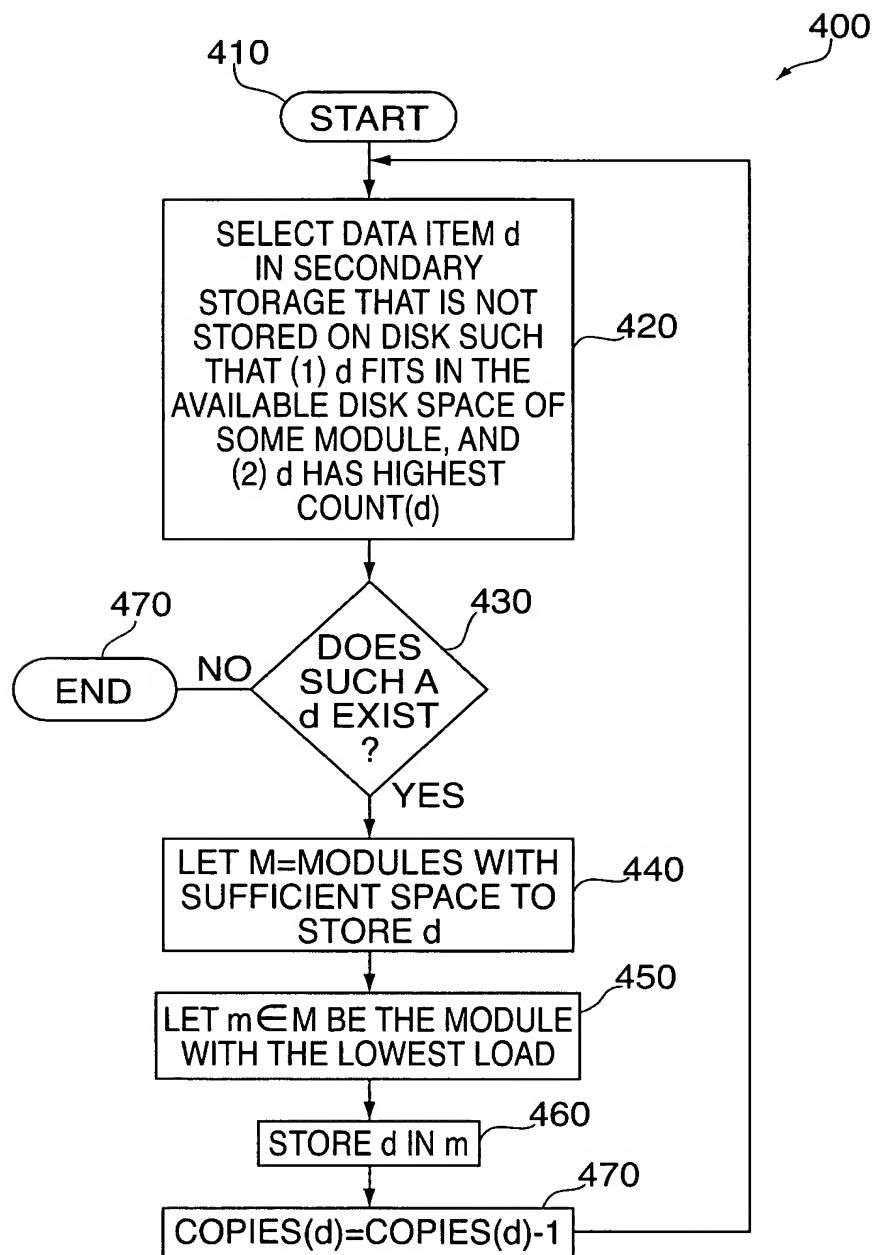A METHOD OF DATA MANAGEMENT FOE EFFICIENTLY STORING AND
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610 START 600

620 MODULES CHECK (IN PARALLEL) IF REQUESTED DATA IS ON THEIR DISKS

630 MODULES WITH DATA SUBMIT VOTES TO HOST CONTROLLER

640 HOST CONTROLLER FORWARDS ACCESS REQUEST TO MODULE WITH LOWEST LOAD

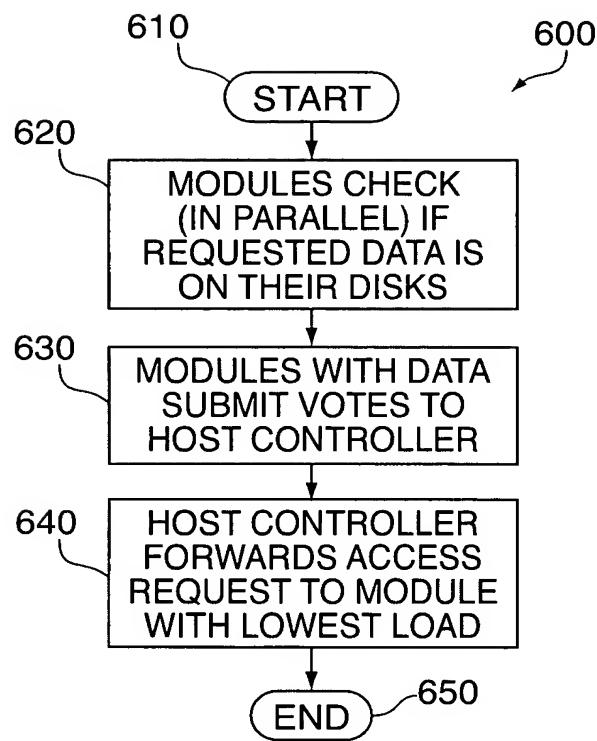END 650

FIG. 6

A METHOD OF DATA MANAGEMENT FOE EFFICIENTLY STORING AND
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700

705

START

LET MAX=MODULE WITH MAXIMUM LOAD
LET MIN=MODULE WITH MINIMUM LOAD ~710

LET C BE A REQUEST IN MAX'S QUEUE
WHERE (1)C IS REQUESTING A DATA
ITEM ALSO ON MIN'S DISK CLUSTER
(2)THE DISK IN MIN'S CLUSTER NEEDED
FOR THE NEXT SERVICE PERIOD HAS
A FREE SLOT ~720

WAS
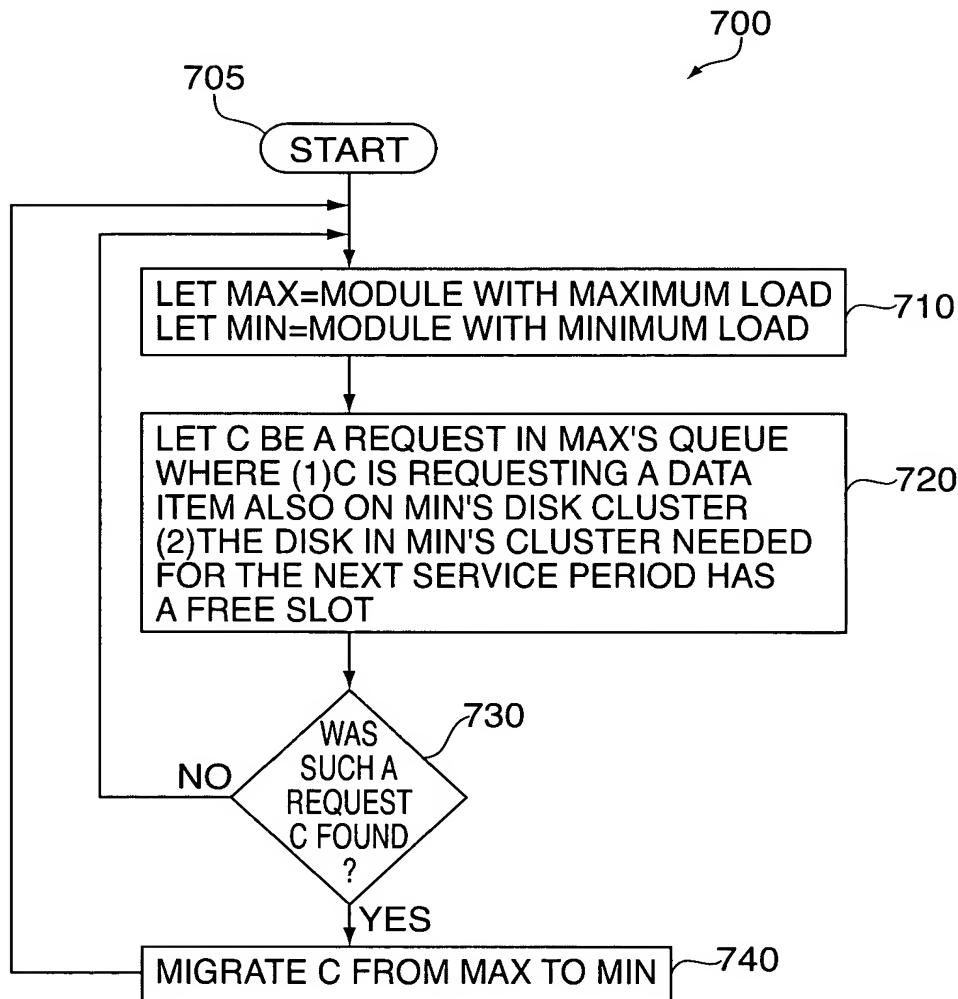SUCH A
REQUEST
C FOUND
? 730

NO

YES

MIGRATE C FROM MAX TO MIN ~740

FIG. 7

A METHOD OF DATA MANAGEMENT FOR EFFICIENTLY STORING AND
RETRIEVING DATA TO RESPOND TO USER ACCESS REQUESTS
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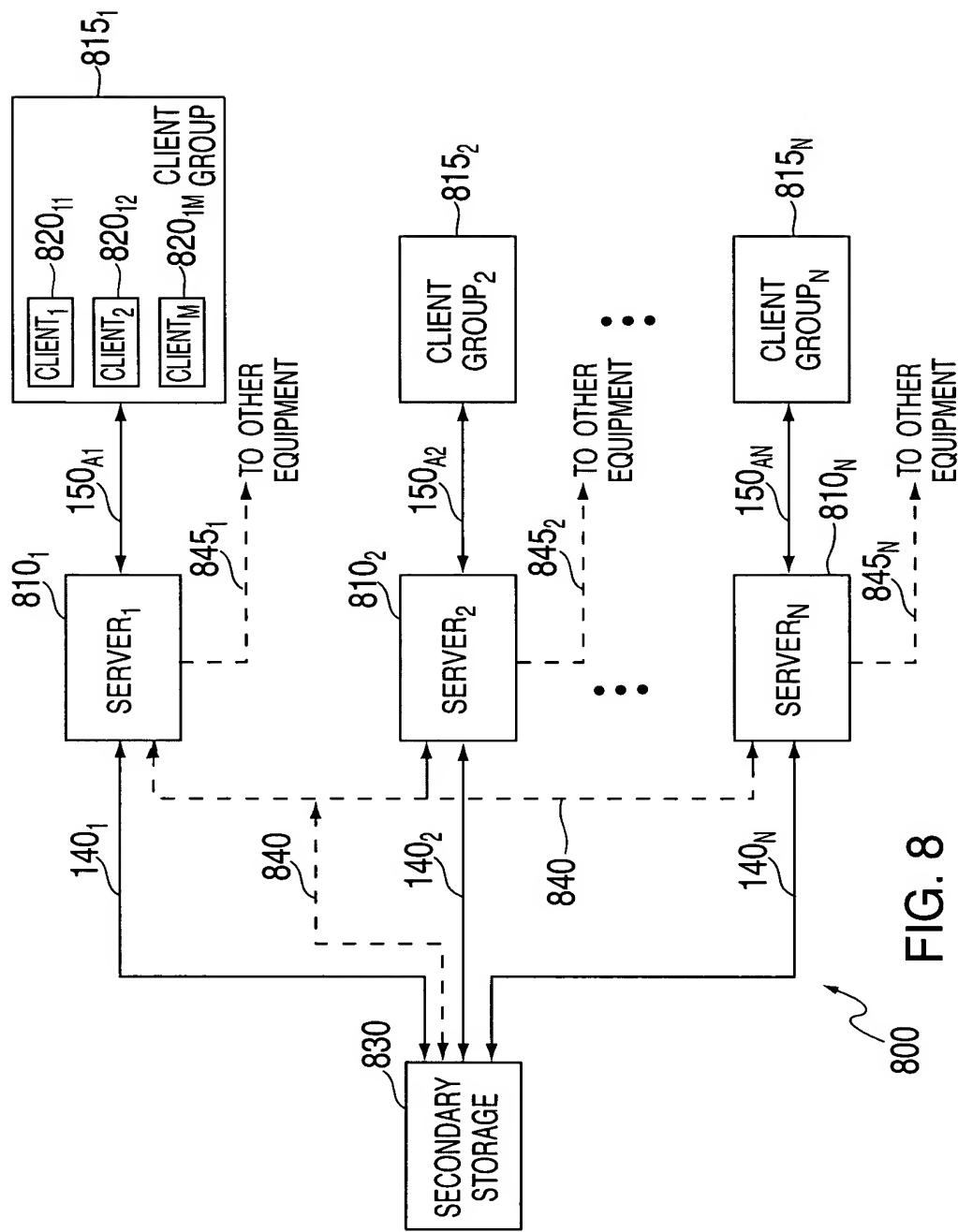
FIG. 8

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901 → PLAY TRACK

902 → FF TRACK

903 → REW TRACK

904 → PROMO TRACK

905 → STILL

906 → META

900

FIG. 9

A METHOD OF DATA MANAGEMENT FOR EFFICIENTLY STORING AND
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FIG. 10

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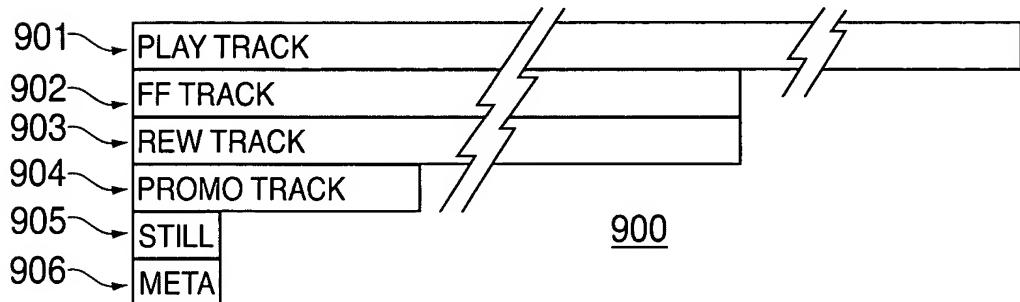## 11/12

FIG. 11

A METHOD OF DATA MANAGEMENT FOE EFFICIENTLY STORING AND
RETRIEVING DATA TO RESPOND TO USER ACCESS REQUESTS
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Attorney Docket No.: DIVA/146CIP1C1
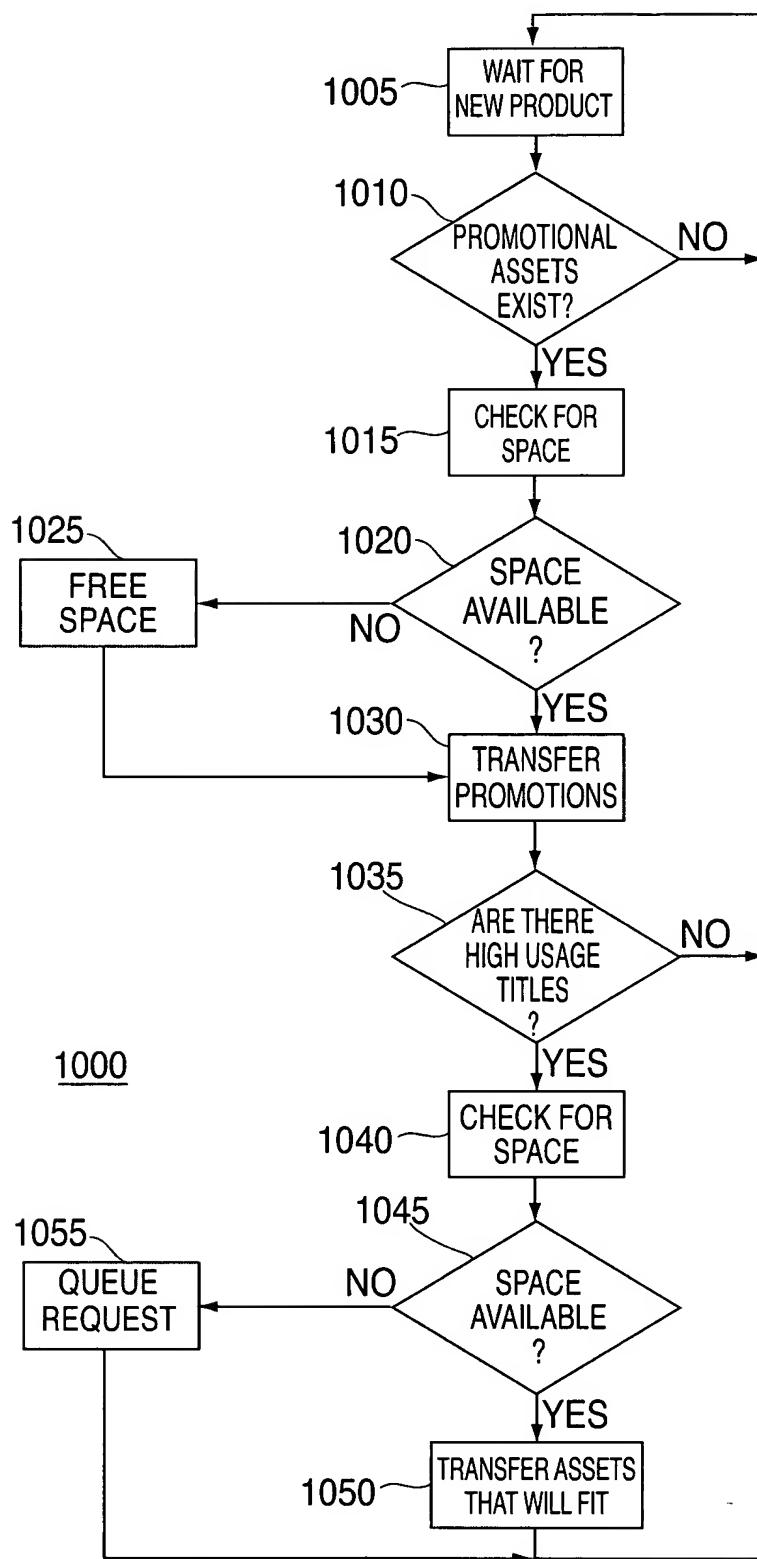Eamon J. Wall, Attorney
Telephone: 732-530-9404

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RECEIVE TITLE REQUEST — 1205
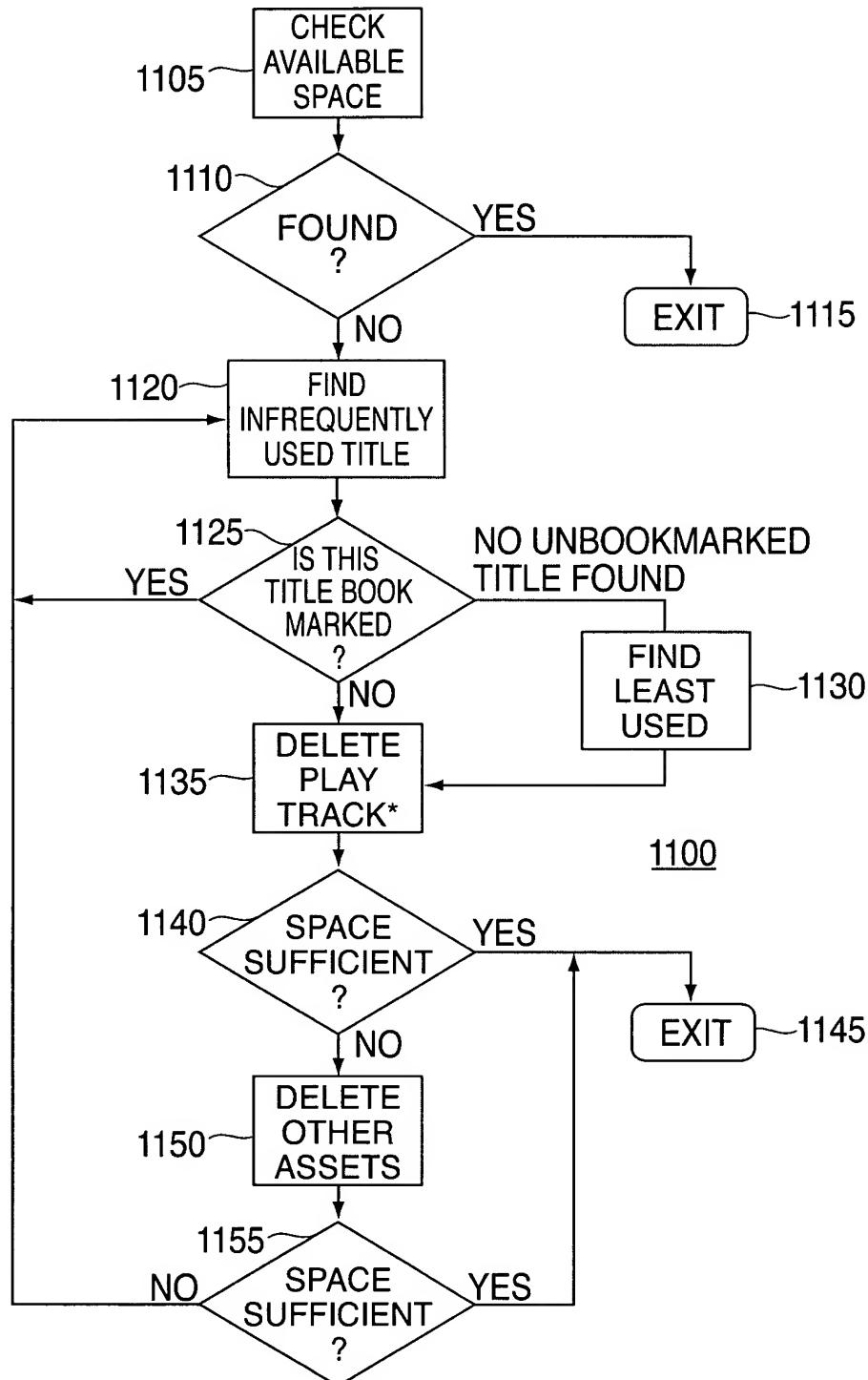
1210

IS REQUESTED TITLE IN PRIMARY STORAGE ?

NO

YES — 1215

BEGIN STREAMING PLAY TRACK TO SUBSCRIBER

1220 — EXIT

1200

1225
BEGIN RETRIEVING PLAY TRACK PORTIONS PROXIMATE CHAPTER DELINEATION POINTS

DONE

CONTINUE UNTIL PORTIONS RETRIEVED OR USER JUMPS TO CHAPTER POINT

JUMP REQUEST

1230

1235
BEGIN PLAY TRACK RETRIEVAL AND STREAMING AT REQUESTED CHAPTER

BEGIN RETRIEVING PLAY TRACK PORTIONS SUPPORTIVE OF TRICK PLAY OPERATION

1240

1245

DONE

CONTINUE UNTIL PORTIONS RETREIVED OR USER ENETRS TRICK PLAY MODE

TRICK MODE REQUEST

1250
BEGIN TRICK PLAY TRACK RETRIEVAL AND STREAMING AT REQUEST POINT

1255
BEGIN PLAY TRACK RETRIEVAL AND STREAMING AT TRICK PLAY TRACK EXIT POINT

BEGIN RETRIEVING REMAINDER OF TRICK PLAY TRACKS

1260

1265

CONTINUE UNTIL TRICK PLAY TRACKS RETRIEVED OR USER INPUT

INPUT

1275
WAIT FOR OR RESPOND TO USER INPUT (JUMP, TRICK MODE ETC...)

1280
EXIT

BEGIN RETRIEVING REMAINDER OF PLAY TRACK AND OTHER ASSETS

1270

FIG. 12